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Progress Report 1: Flooding by Waller Creek along 45th Street

We have analyzed the existing GIS file for Waller Creek that flows through the 45th Street and Avenue F. Figure 1 displays the map of the intersection between 45th Street (that runs horizontal from northwest to southeast) and Avenue F (that runs vertical from southwest to northeast).



Figure 1: Intersection between 45th Street and Avenue F

The black outline shown in Figure 1 involves the 25-year floodplain while the green outline serves as the 100-year floodplain. Consequently, as displayed in Figure 1, the apartment complex

falls completely under both the 25-year and 100-year floodplain. As shown in Figure 2 that displays the street view of the apartment complex and Waller Creek, the apartment/condo complex lies directly next to Waller Creek. Therefore, since the apartment complex lies completely under the 25-year and 100-year floodplain, the probability of flooding at this location due to Waller Creek seems decently high.



Figure 2: Apartment/Condo Complex (Left) and Waller Creek (Right) along Avenue F

Hence, in this project, we focused on analyzing methods to remediate the flooding risk along the region indicated in Figure 1. First, we decided that one probable solution involved increasing the cross-sectional area of Waller Creek, such as increasing the depth or the width of Waller Creek. This characteristic, assuming uniform and steady flow, yields a larger hydraulic radius and hence requiring a larger velocity for the creek running full. Meanwhile, we also considered raising the elevations of bridges and buildings that are under the 25-year floodplain along Waller Creek. For instance, as shown in Figure 2, the apartment complex seems to be slightly above Waller Creek. Hence, we can raise the elevation of this complex and then assess the flooding risk along these regions in the floodplain.

Currently, we have identified the provided HEC-RAS model of the entire Waller Creek, and we seem to have identified the cross sections pertinent to this region. Therefore, we can

modify those corresponding cross sections and then compare the velocities through the cross sections before and after modification. However, we may need to know how to modify the cross-sections for raising the elevation of buildings in the area.

The current base map of the region, without implementing our proposed solution, has been created using ArcGIS. Figure 3, displayed below, shows this base map created by Scott Cameron using ArcGIS.



Figure 3: Base Map of Region